



The Airport Runoff Manual

Stormwater Design To Avoid Wildlife Attractants



**Washington State
Department of Transportation**

Presentation Overview

- Project overview
- Project objectives
- Manual modifications
- Airport Runoff Manual status
- Schedule and next steps



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Project Overview

Legislature Directs WSDOT to Take Action

- Legislation introduced in 2004 by Senators Haugen, Mulliken, Horn, Morton, Plug and Kastama (Senate Bill 6173).
- The bill required stormwater and wetland mitigation for the state's public use airports to promote safety.
- Passed out of the Senate but was unable to move out of the House Resource and Agriculture Lands Committee.
- Senator Haugen directed WSDOT to gather interested parties to explore solutions to storm water and other wildlife attractants near airports.

Hazardous Wildlife Attractant Task Force

Created In 2004

The Task Force is a 28 member committee.

- The committee is represented by legislative staff, airport sponsors, environmental groups, community groups, public ports, and state and federal agencies.

Task Force Recommendations

- Develop an Airport Stormwater Guidance Manual
- Draft Memorandum of Understanding.
- Develop Mediation Process.

How WSDOT is Addressing the Issue?

- Secured a \$190,000 grant from the FAA to study issues surrounding hazardous wildlife attractants near airports and develop airport stormwater guidance.
- Hired Herrera Consultants to lead development of Airport Runoff Guidance Manual.
- ARM to update WSDOT Highway Runoff Manual to address airport runoff guidance.
- 28-member Task Force to provide input on the proposed Airport Runoff Manual

Project Objectives

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- Safety
- Compliance with Regulatory Requirements
- Consideration of airport operations
- Integration of stormwater BMP's with wildlife attractant BMP's
- Predictability in the regulatory process
- Approval by Department of Ecology and WSDOT

Manual Modifications

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- Application thresholds
 - Airside vs. landside
- Recommended BMP types
 - Example: No permanent water bodies
- Modifications to individual BMPs
 - Example: Pond configuration
 - Example: Infiltration rates

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Application Thresholds

	Pollutant	Landside	Airside
Basic Treatment	Sediment	Amount added impervious	Amount added impervious
Enhanced	Dissolved metal	ADT volume	Runway touchdown area
Oil Control	Petroleum products	Intersection ADT, parking, maintenance	Refueling, aircraft gates, parking area
Phosphorus	Nutrient	Discharge to listed waters	Discharge to listed waters

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Recommended BMP Types – General Rules

- BMPs taken from HRM or Ecology manuals
- Avoid permanent standing water:
 - No wet ponds or wetlands
 - Emphasis on quick drainage
 - Detention ponds okay because drain between storms
- Avoid attractive vegetation
 - Food sources
 - Shelter
- Eliminate obstacles to aircraft
 - No obstacles in flight path (trees)
 - Stable soils around runways/taxiways

Recommended BMP Types for Flow Control

BMP Type	HRM	ARM
Infiltration / Dispersion	X	X
Regional Facility	X	X
Combined Flow / Treatment	X	
Detention	X	X
Category 1 BMP (Wet Vaults)		X
Category 2 BMP (CAVFS)		X

Recommended BMP Types for Runoff Treatment

BMP Type	HRM	ARM
Infiltration / Dispersion	X	X
Oil Control – Absorbent boom on pond, Bioinfiltration pond (Eastern WA)	X	
Oil Control – Sand filter, Separators		X
Phosphorus – Large wet pond	X	
Phosphorus – Enhanced sand filter, treatment train		X

Recommended BMP Types for Runoff Treatment

BMP Type	HRM	ARM
Basic – VFS, swale, wet swale, wet pond	X	
Basic – VFS, swale, Ecology embankment, linear sand filter		X
Enhanced – CAVFS, Ecology embankment, constructed wetland	X	
Enhanced – CAVFS, Ecology embankment, enhanced sand filter, treatment train		X
Category 1 – Proprietary media filtration		X
Category 2 – Submerged gravel filter		X

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Manual Modifications

- Tables for each BMP specifying appropriate locations

Eastern Washington	Yes		Object Free Area (OFA)	Yes
Western Washington	Yes		Runway Safety Area (RSA)	Yes
Landside Areas	Yes		Taxiway Safety Area (TSA)	Yes
Airside Areas	Yes		Clearway (CWY)	Yes
			Stopway (SWY)	Yes

Airport-Specific Vegetated Filter Strip

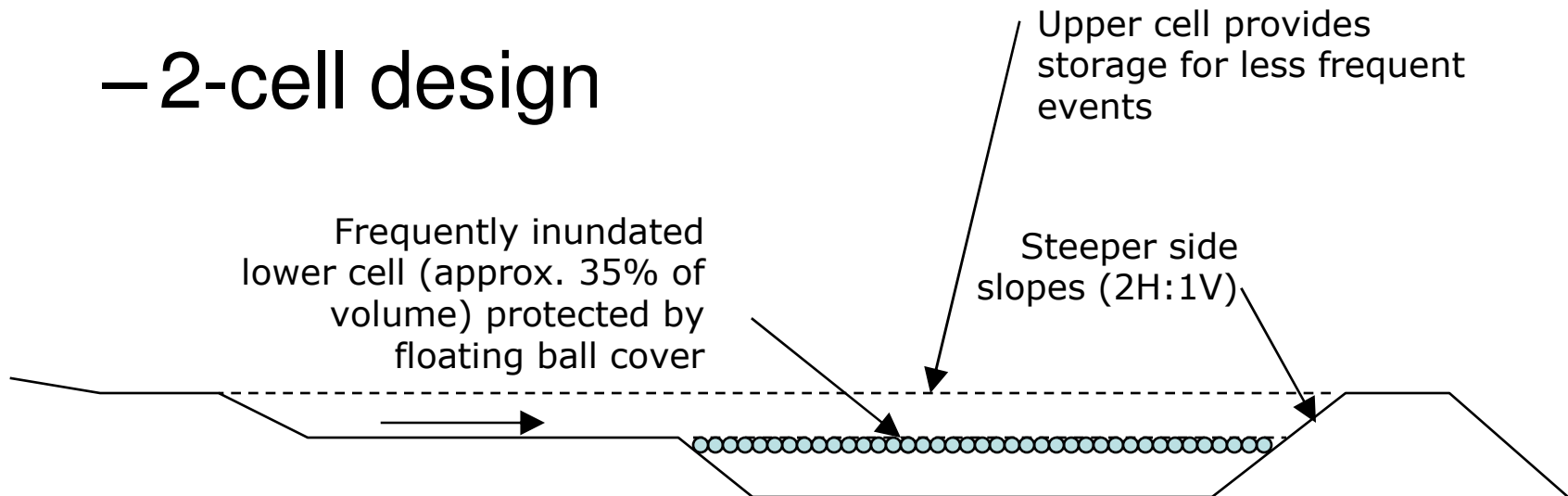
- CAVFS limited to top 4 inches in airside applications
- CAVFS use within 100 feet of airfield operations areas should include measures to control worms that may attract wildlife
- If a gravel flow spreader is used, gravel should be outside of the runway shoulder and should meet the specifications for shoulder ballast listed in Section 9-03.9(2) of the WSDOT Standard Specifications.

Airport-Specific Pond Modifications

- Alternate pretreatment required (proprietary hydrodynamic separator, filter strip or swale)
- Two-cell configuration
- Avoid irregular-shaped ponds and maximize length to width ratio
- Steeper side slopes
- Vegetation restrictions
- Planting of bottom of upstream cell required (see Appendix A)
- Flow spreader required at inlet
- Elimination of sediment storage depth to reduce hazard associated with standing water
- Same volume captured, same quality of treatment provided while discouraging wildlife!

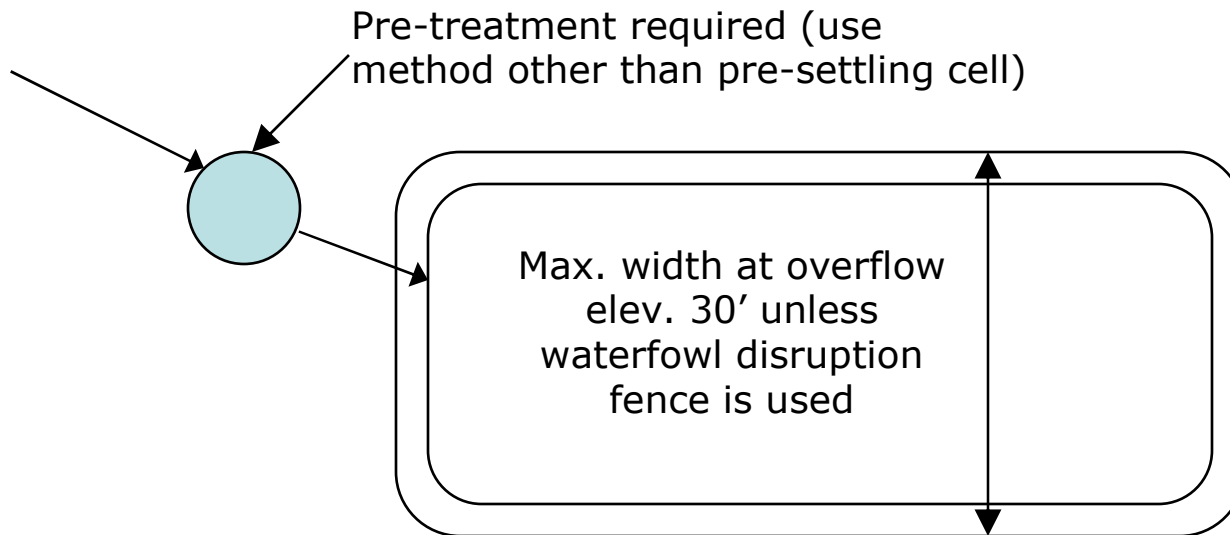
BMP Design Guidelines

- Detention Ponds (BMP FC.03)
 - Steeper side slopes
 - 2-cell design



BMP Design Guidelines

- Infiltration Pond (BMP IN.02)
 - 1 in/hour infiltration rate (rather than 0.5 inches/hour as in HRM)



Additional airport-specific considerations (Appendices)

- **A – Vegetation**

- No vertical intrusions into airspace (trees)
- Minimize food sources
- Minimize shelter
- Minimize required maintenance
- Combination of factors
- Lists of acceptable and non-acceptable vegetation

Additional airport-specific considerations (Appendices)

- **B – Wildlife of Concern at Airports**
 - Waterfowl
 - Birds of prey
 - Doves and pigeons
 - Cranes
 - Pelicans
 - Herons
 - Shorebirds
 - Crows/Ravens
 - Other small birds
 - Deer
 - Coyotes

Additional airport-specific considerations (Appendices)

- **C – Open Water Controls**

- Allows for retrofit of existing facilities
- Methods prioritized based on effectiveness per WSDOT/TAC comments
- Habitat suitability reduction (vegetation, disruption fences)
- Open water covers (floating covers, floating ball covers)
- Open water access elimination (netting, wires)

Manual Status

Airport Runoff Manual Status

- Manual text – review by WSDOT
- BMP Design guidelines – review by TAC or Task Force
- Ecology coordination/review

Schedule and Next Steps

Proposed Meeting Schedule and Public Comment

- **Task Force Meeting Schedule**

- Task Force: October 30, 2007 -- Review Draft Airport Runoff Manual/BMP
- January 9, 2007: Review Public Comments and provide recommendations

- **Public Review Schedule**

- Public Meeting: December 5, 2007 – Presentation on the Airport Runoff Manual
- Public Comment Period: Comment period open for 20-days November 28 through December 18

- **Adoption by WSDOT and Department of Ecology**

- June 2008

Schedule and Next Steps

- **October 25, 2007:** Submission of Draft Airport Runoff Manual to Task Force
- **October 30, 2007:** Task Force Meeting
- **November 7, 2007:** Task Force Comments submitted to consultant
- **November 28, 2007:** Start of public comment period
- **December 5, 2007:** Public Meeting
- **December 17, 2007:** End of public comment period
- **January 9, 2008:** Task Force Meeting to consider public comments and provide recommendations